REMARKS

Applicant's counsel thanks the Examiner for the careful consideration given the application. Original claims 1-18 have been deleted and a new set of claims 19-26 has been added. In particular new independent claims 19, 20 and 21 have been added and are now pending. Reconsideration and re-examination of the application as amended is respectfully requested.

SPECIFICATION

According to the Examiner's request a substitute specification in compliance with 37 CFR 1.52 (a) and (b) has been submitted. A substitute specification, including a marked-up copy showing the changes, is enclosed herewith. The applicant herewith declares that the specification as modified does not contain any new matter.

CLAIMS (NEW MATTER)

The amendments to the claims do not add any new subject matter. Indeed such amendments are clearly supported by the original text.

With regard to new independent claim 19, please note that all the technical features included therein are supported by original claims 1, 3, 4, 8, 9 and 10.

Moreover please note that newly added independent claims all precisely define the shape of the primary holes which are clearly described from page 4, last two paragraphs, to page 5, first two paragraphs of the specification as originally filed (now page 4, last three paragraphs to page 5, first paragraph). The same primary hole as now claimed is also clearly shown in figure 5.

Please note that all the claims refer to the same technical features and differ one from the other exclusively due to their titles.

In view of the above considerations it is felt that no matter has been added in redrafting the independent claims.

With respect to dependent claims, please note that claim 22 is clearly supported by original claim 5.

Claim 23 is clearly supported by original claims 6 and 7.

Newly added claim 24 is clearly supported by claim 17; newly added claim 25 is clearly supported by original claims 6 and 7; newly added claim 26 is clearly supported by original claim 18.

CLAIM OBJECTIONS

Please note that expressions such as "similar materials" and "or the like" have been omitted from newly filed claims.

All dependencies have been checked and all technical features now included in dependent claims should now present proper antecedent basis.
In view of the above it is felt that all claim objections have been overcome.

CLAIM REJECTIONS – 35 USC 103 (a)

Claims 1-18 were rejected under 35 USC 103 (a) as being unpatentable over Rogers (fig. 9) or Watkin (fig. 1). Newly filed independent claims are clearly new and inventive over the art made of record.

Please note that all independent claims clearly define the structure of the primary holes which consist of a first, a second and a third cylindrical portions having a circular cross section consecutive one to the other from the top surface of the mattress, pillow or cushioning element towards the inside of the product.

The first portion (5a) has a diameter greater than the diameter of the second portion (5b) which is in turn greater than the diameter of the third portion (5c). Moreover each primary hole comprises a transition region (6) between the first and the second portion and between the second and the third portion. Each transition region (6) has a cross section which linearly and progressively decrease from one portion towards the other as clearly shown in figure 5 of the present patent application. No one of the prior art shows or discloses a similar holes structure.

Rogers, especially referring to figure 9, discloses a plurality of holes, each having a first portion placed in correspondence of the support surface having, in cross section, a width smaller than the width of the second portion 40 (the opposite with respect to the present invention). Moreover Rogers fig. 9 only shows a sole transition region (the one connecting the first portion to the second portion 40) having anyway a cross section progressively increasing from the first portion towards the second portion. In other words the primary holes as now claimed are completely and structurally different from the holes shown by Rogers in figure 9.

Also Watkin (referring now to figure 1, extension 12) only discloses a first and a second portion of cylindrical conformation, the first portion placed in correspondence of the support surface having a diameter greater than the diameter of the second portion. Anyway such a prior art does not disclose any third portion consecutive to the second portion having a diameter smaller than the diameter of the second portion and it does not disclose two transition regions with a diameter decreasing from the first to the second and from the second to the third portion.

Also Berman does not disclose the geometrical shape of the primary holes as now claimed. In particular figure 7 discloses a plurality of stepped holes but anyway no transition regions can be seen between the various

holes. Also figure 8 does not show the primary holes having the geometry now claimed.

Please also note that one of the object of Berman invention is to provide a "cushion comprising a plurality of non-cylindrical cavities so constructed and arranged as to provide a maximum amount of movement while at the same time retain their operative relation" (Berman column 3, lines 61-66).

Lanteri discloses a pillow provided with a plurality of passing cylindrical holes (see figure 1) or provided with a plurality of dead holes extending from one or the opposite side of the pillow (see figure 4). Again such a document does not disclose the primary holes as now claimed.

Valkenburgh discloses a yieldable pad presenting two shapes of holes (see figure 4 and 6). No one of these holes presents anyway three consecutive cylindrical portions of fixed diameter and two transition regions as now claimed.

Please note that the adopted solution allows the mattresses and pillows according to the present invention to have a varying density along its thickness. The cushioning element density results from the particular conformation of the primary holes 5. Indeed, the various portions have different sections and therefore different resistance to pressure so as each portion is deformable depending on a pre-established depressure value.

Moreover, the use of transition regions presenting a cross section progressively decreasing avoids the generation of concentrated stresses which can break the latex main body.

Indeed the absence of transition regions, i.e. the presence of indentations forming right-angled edges, causes the rise of high stresses in the structure.

Indeed the use of cilindrical portions alternated with tapering portions allows to define different levels of density inside the mattress.

More in detail the mattress according to the invention has got a first level (5) of constant and low density; a second level (6) of increasing density along the thickness; a third level (5b) of constant and medium density; a fourth level (6) of increasing density and a fifth level (5c) of constant and high density.

In other words the use of the primary holes according to the claims allows to define at least five density levels inside the mattress or the pillows, so as to adapt to the weight of the user. The possibility of differentiating the density of the support surface in a discrete manner allows a correct positioning of the user's body. The body of the user does not sink into the mattress in a undifferentiated matter, but it is supported by the different spring reactions of element 1 resulting from the different density of the different regions.

It is sincerely believed that a skilled person may not obtain the claimed solution by only combining the teachings of the prior art documents without running an inventive step.

It is also to be noted that, none of the prior art documents cited and used during examination procedure both alone and in combination with one or more of the prior art documents, is able to suggest a provision like the one claimed. Therefore the application, according to claims 19, 20 and 21 and the dependent claims is inventive over the art of record.

CONCLUSION

Applicant's counsel remains ready to assist the Examiner in anyway to facilitate and expedite the prosecution of this application. All matters have been addressed above and in view of the pending claims and remarks, it is believed that the application is now in condition for allowance which is respectfully requested.

If there are any further fees required by this communication, please charge such fees to our Deposit Account No. 16-0820, Order No. 36249.

Respectfully Submitted,

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S P E C I F I C A T I O N

CUSHIONING ELEMENT FOR MATTRESSES, PILLOWS AND THE LIKE

FIELD AND BACKGROUND OF THE INVENTION

The present invention relates to a cushioning element for mattresses, pillows and the like. In particular, it ~~pertains to~~ regards a cushioning element such as a slab for mattresses or pillows made of latex and ~~to be used~~ employable in beds, sofas, etc.

It is known that cushioning elements, such as slabs for mattresses made of latex, ~~consist of a single body~~ are monolithic items having a plate-like conformation with a ~~substantially~~ parallelepiped extension; the mattress has an upper surface ~~set~~ to support a user's body and a lower surface ~~designed~~ adopted to rest on the bed frame.

These mattresses are ~~obtained from conversion of~~ manufactured using a raw material (latex) converted from a liquid state to a foamy state and successively converted to a solid state by ~~a final~~ vulcanization ~~step~~.

By virtue of the particular elastic properties of the ~~material of which the~~ mattress ~~is made~~ material, the latter ~~is able to model itself in conformity~~ conforms in shape with the user's shape and weight. In this way, the user's prominent and heavy body parts sink into the upper surface of the mattress in an attempt to keep the user's backbone in a correct horizontal posture.

Likewise, pillows are made with the same techniques used for mattresses and perform ~~the same~~ analogous tasks.

~~In fact, pillows model themselves based on the weight and conformation of the user's skull~~ Indeed later pillows conform

their shape to the user's skull separating also on the skull's weight, keeping the cervical vertebrae to a correct posture.

~~Also known are pillows~~ Pillows and mattresses having a series of ~~blind~~ dead holes at the respective lower and/or upper surfaces are also known.

These holes have a frustoconical conformation tapering inwardly of the mattress or pillow~~,~~ and allow to obtain a constantly increasing stiffness as the user's weight increases.

In addition, in order to ~~differentiate the~~ define regions of greater density, i.e. ~~the~~ mattress or pillow regions ~~where greater weight is exerted by the user~~ adapted to receive heavier weights (e.g. regions corresponding to the user's shoulders and pelvis), the overall holes' ~~hole~~ number or diameter is ~~provided to be varied~~ increased or decreased. In this way the cushioning and ~~deforming~~ deformation capability of the upper surface in contact with the user is further improved.

The above described cushioning elements however have some drawbacks or operating ~~limits~~ problems.

~~They are in particular mainly connected with the impossibility of~~ Actually it is impossible to change the cushioning ~~element~~ element's density ~~being differentiated along~~ as a function of the element thickness, depending on the user's weight.

~~In fact, it is to be noted that~~ Indeed, due to the conformation of said known holes, the density of the cushioning element cannot be varied in a discrete manner.

In particular, the known hole conformation which consists in tapering away from the user's support surface, only enables

the density of the cushioning element to be increased in an incremental manner as the weight increases.

Consequently, owing to the user's weight the cushioning element has a tendency to ~~become hollow~~ assume excessive concavity sometimes causing an excessive sinking of the user's body thereinto.

Under this situation, the user could find himself/herself in a non optimal condition.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention ~~aims at making~~ to manufacture a cushioning element for mattresses and pillows solving the above mentioned ~~problem~~ problems.

In particular, it is an aim of the present invention to ~~make~~ manufacture a cushioning element to be used in mattresses and pillows in which the density of the element itself is varied in a discrete manner along the thickness thereof.

~~In more~~ More in detail, it is an aim of the present invention to ~~make available~~ provide for a cushioning element having differentiated density values so that it ~~is adapted to~~ can bear any weight ~~force~~ applied locally by the user, irrespective of the support region and the weight value.

It is another aim of the present invention to ~~make~~ provide for a mattress and a pillow capable of solving the above mentioned problem.

The foregoing and still further aims ~~that will become more apparent in the course of the following description~~ are achieved by a cushioning element for mattresses, pillows and the like

comprising the features set out in ~~claim 1 and in~~ the set of claims ~~depending thereon~~.

BRIEF DESCRIPTION OF THE DRAWINGS

Further features and advantages will be ~~best~~ understood from the detailed description of a preferred, but not exclusive, embodiment of a cushioning element for a mattress and a pillow in accordance with the present invention. This description will be set forth hereinafter with reference to the accompanying drawings, given by way of non-limiting example, in which:

- Fig. 1 is a perspective view of a cushioning element in accordance with a first embodiment of the invention:
- Fig. 2 is an elevation side view in section of the cushioning element shown in Fig. 1 in a use condition;
- Fig. 3 is a perspective view of a cushioning element in accordance with a second embodiment of the present invention;
- Fig. 4 is an elevation side view in section of the cushioning element shown in Fig. 3 in a use condition;
- Fig. 5 is a diagrammatic view of a ~~construction detail of~~ primary hole provided in the cushioning element.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to the drawings, a cushioning element for mattresses, pillows and the like in accordance with the invention has been generally identified by reference numeral 1.

Referring to Figs. 1 and 2 ~~in which~~ showing a first embodiment ~~is shown~~, the cushioning element 1 has a main body 8

of substantially plate-like conformation having a rectangular perimeter extension.

Preferably, the cushioning element 1 is internally made of latex and has a horizontal support surface 2 designed to bear the body of a user A (see Fig. 2), and a base surface 3, opposite to the support surface 2 and designed to ~~be associated with~~ rest on the frame 4 of a bed ~~(diagrammatically shown in Fig. 2)~~.

At least one primary hole 5 ~~with a longitudinal extension~~ consisting of at least two portions 5a, 5b consecutive to each other is formed in the support surface 2.

In more detail, still with reference to Fig. 2, element 1 has a plurality of primary holes 5 disposed on at least a part of the support surface 2 and preferably along the whole support surface 2 itself.

~~It is to be pointed out that the~~ The number and arrangement of the primary holes 5 vary depending on the density ~~that is wished~~ to be given to the support surface 2 along the plane. For example, regions of the support surface 2 having a greater number of holes 5 may be provided, so that density on the surface 2 itself can be ~~diversified~~ changed.

In particular, each hole 5 (shown in detail in Fig. 5) that is advantageously ~~blind~~ a dead hole, has at least three portions 5a, 5b, 5c consecutive to each other, each of them having a different cross-section width. Portions 5a, 5b, 5c are coaxial with each other and between one of said portions

5a, 5b, 5c and the respective adjacent portion a transition region 6 extends.

More particularly, portions 5a, 5b, 5c have a cylindrical conformation with a circular base and their cross-section width (diameter) respectively decreases on moving ~~away~~ from the ~~support surface 2~~ first to the third portion.

In other words, portion 5a that is close to the support surface 2 has a cross-section width greater than the ~~median~~ middle portion 5b that in turn has a greater size than the distal portion 5c, with respect to the support surface 2.

~~It is to be pointed out that the~~ The transition region 6 can be of a shape tapering away from the support surface 2, as shown in detail in Fig. 5, so as to define flared section variations.

~~Alternatively, the transition region 6 could consist of an indentation forming a right-angled edge defining a sudden section variation.~~

~~In addition, at~~ Moreover, in correspondence of the base surface 3 at least one secondary ~~blind~~ dead hole 7 is formed.

Advantageously, a plurality of secondary holes 7 may be provided; ~~that are~~ such secondary holes 7 may be at least partly formed on the base surface 3.

Each secondary hole 7 has a substantially frustoconical extension in longitudinal section, tapering away from the base surface 3.

Referring to Figs. 3 and 4 in ~~which~~ showing the second embodiment ~~is shown~~, the cushioning element 1 has a prismatic conformation with a rectangular perimetral extension.

In more detail, the support surface 2 is at least partly rounded and designed to hold up the head of user A.

Advantageously, both the support surface 2 and base surface 3 ~~are fully rounded or~~ convex as better shown in Fig. 4.

~~It is to be pointed out that the~~ The support surface 2 may have several convex regions so as to show a predetermined undulation. This undulation varies depending on the physical features of user A and on the construction requirements (e.g. the shape of the anatomic pillows presently on the market ~~can be an example~~).

The support surface 2 too is at least partly provided with a plurality of primary holes 5 of the type described above in detail.

As shown in Fig. 4 by way of example only, the support surface 2 has a central region 2a in which said primary holes 5 are formed and a contour region 2b in which the secondary holes 7 are formed. In accordance with this embodiment, holes 7 have a constant and substantially cylindrical extension in longitudinal section.

Alternatively, the secondary holes 7 ~~too~~ may also have a frustoconical extension as previously described.

The base surface 3 ~~too is~~ may also be provided with said primary holes 5 at a central region 3a thereof and with the secondary holes 7 at a contour region.

The present invention also refers to a mattress of the type having a laminar conformation with a rectangular peripheral extension. Said mattress comprises the cushioning element 1 of the above described type.

Advantageously, as shown in Fig. 1, the mattress is ~~fully~~ made up of the cushioning element 1 (possibly with a cover thereon) in accordance with the first embodiment shown in Figs. 1 and 2.

In addition, the present invention also refers to a pillow 9 of a prismatic conformation with a rectangular peripheral extension. The pillow comprises the cushioning element 1 in accordance with the second embodiment described above.

Preferably, as shown in Figs. 3 and 4, pillow 9 is ~~fully~~ made up of the cushioning element 1 (possibly with a cover thereon).

Advantageously, the cushioning element 1 has a support surface 2 with a varying density based on user A's weight.

The cushioning element density ~~results~~ derives from the particular conformation of the primary holes 5. ~~In fact~~ Indeed, portions 5a, 5b, 5c have different sections and therefore different resistance to pressure, so that, along their thickness, each portion is deformable depending on a preestablished pressure value.

In this way when a given pressure is applied to the support surface 2, the proximal portion 5a that is wider and therefore less resistant, undergoes a strong deformation along its longitudinal extension until region 6 separating portion 5a from the consecutive median portion 5b. ~~Obviously~~ Consequently the deformations to which the second portion 5b is submitted will be much smaller.

However, if a high pressure is exerted the ~~median~~ middle portion 5b too is fully deformed until region 6 separating said median portion 5b from the distal portion 5c.

Assuming that a very high pressure is exerted, the distal portion 5c too will be greatly deformed. In other words, three density levels are defined that correspond to portions 5a, 5b, 5c, each of them having a deformability value of its own.

For example, with reference to Fig. 2, the body parts of user A of greater weight appear to be supported by the ~~median~~ middle portion 5b or distal portion 5c, whereas the lighter body parts lie on a level close to the support surface 2.

Likewise, also in the case shown in Fig. 4, the head-rest areas that ~~are of~~ bear a greater weight portion are held up by the support surface 2 at a distal level thereof whereas the lighter areas (such as the neck-supporting area) are held up by the support surface 2 at a level close thereto.

The present invention solves the drawbacks ~~found in~~ of the known art and achieves the intended purposes.

~~In fact,~~ Indeed, giving the possibility ~~of differentiating~~ to differentiate the density of the support surface 2 in a discrete manner (so as to adapt it to the user's weight) allows a correct positioning of the user's body.

~~It is to be pointed out that the~~ The body of user A does not sink into the cushioning element 1 in an undifferentiated manner, but it is supported by ~~the~~ different ~~spring~~ elastic reactions of element 1 resulting from ~~the~~ different densities of the different regions.

Advantageously, the user's backbone is always maintained ~~substantially horizontal~~ in substantial horizontal layout, whereas the heavier parts such as the pelvis or shoulders of user A penetrate deeper in the mattress, ~~until~~ close to the ~~median~~ middle portion 5b or distal portion 5c.

Likewise, in the embodiment of Fig. 4 too, the backbone's cervical vertebrae keep a correct position resting in alignment on the support surface 2.

Consequently the back of user A keeps a correct posture and the support surface 2 adjusts itself following the user's profile without excessive yielding ~~too much~~.

~~All of the details can be replaced by other technically equivalent elements and practically all materials herein employed, as well as the sizes can be of any nature and magnitude depending on requirements.~~